Center for Advanced Signal and Image Sciences

SIGNAL AND IMAGING SCIENCES

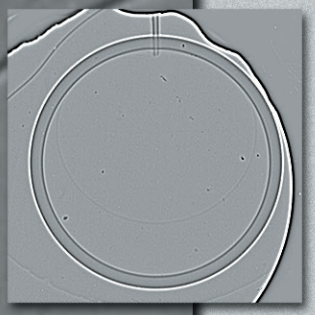
WORKSHOP

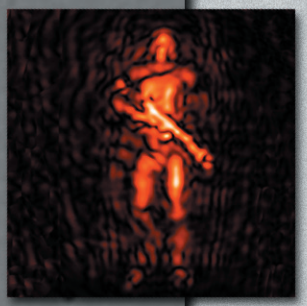
November 18-19, 2004

at Lawrence Livermore National Laboratory

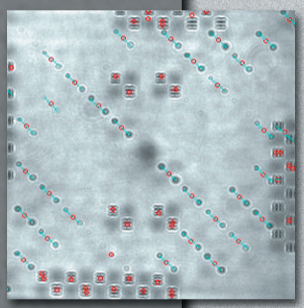
Building 123 Auditorium

(P-cleared Area)



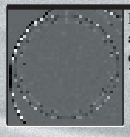


AGENDA



CASIS is a workshop for LLNL, UC community personnel and others to share accomplishments, ideas, and areas of need in the Signal, Imaging and Communications Sciences.

Sponsored by LLNL Engineering Directorate

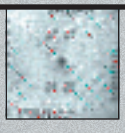


Liquid gas layer of deuterium and tritium inside a 2-mm diameter beryllium capsule.

Data courtesy of Bernard Kozioziemski Image courtesy of Dan Schneberk, Darrell Rikard

Reconstructed Radar Camera image through wall-board of a person holding a rifle.

Data and image courtesy of Kique Romero



Calibration data for optics inspection.

Data and image courtesy of Laura Kegelmeyer

This work was performed under the auspices of the U.S. Department of Energy, National Nuclear Security Administration by the University of California, Lawrence Livermore National Laboratory under contract No. W-7405-Eng-48.

AGENDA

Signal and Imaging Sciences Workshop

Center for Advanced Signal and Imaging Sciences

Lawrence Livermore National Laboratory

THURSDAY, NOVEMBER 18, 2004 BUILDING 123 AUDITORIUM

8:15AM ..... **Registration and Continental Breakfast**

8:45 **Stephen Azevedo,** C.A.S.I.S. Director ..... **Opening Remarks, Introductions**

8:55 **Dr. Steven Patterson,** AD Engineering ..... **Welcome from Engineering**

9:00 **Prof. James H. McClellan, Keynote Speaker,** Georgia Institute of Technology
Array Signal Processing for Locating Buried Objects and Tracking Moving Targets

10:00 ***MORNING BREAK— Complimentary***

ADAPTIVE OPTICS
Scot Olivier, *Session Chair*

10:15 Carmen Carrano ..... *Enhanced Surveillance Imaging*

10:30 Lisa Poyneer..... *Experimental Results for Correlation-based Wave-front Sensing*

10:45 Lisa Poyneer..... *Optimal Modal Fourier Transform Wave-front Control*

11:00 David Palmer ..... *Ultra-high Contrast Imaging Experimental Results*

11:15 Kevin Baker ..... *Correction of Distributed Aberrations*

11:30 Diana Chen..... *Ophthalmic Imaging with Adaptive Optics*

11:45 ***LUNCH BREAK— Complimentary***

APPLIED IMAGING
David Paglieroni, *Session Chair*

1:15 Eugene Ingerman, UC Davis ..... *Nonlinear Structured Illumination Microscopy*

1:30 David Paglieroni ..... *Cueing Images with the Image Content Engine (ICE)*

1:45 Aseneth Lopez ..... *Phase-Based Road Detection in Multi-Source Images*

2:00 Charles Grant ..... *Anticipated Data Structures and Algorithms for Use With Graph Based Remote Sensed Image Content Storage and Retrieval*

Thursday, November 18, 2004 **Building 123 Auditorium**

APPLIED IMAGING

David Paglieroni, *Session Chair*

2:15 W. J. Wright ..... *Infrared Imaging to Quantify Temperature Changes During Rapid Materials Deformation*

2:30 Sean Lehman ..... *The Search for Classical Helike*

2:45 Daniel White ..... *Simulation of Magnetic Resonance Imaging Eddy Currents Using EMSolve*

3:00 ***AFTERNOON BREAK — Complimentary***

SCIENTIFIC DATA MINING

Chandrika Kamath, *Session Chair*

3:15 Chandrika Kamath ..... *Comparing Simulations to Experiments: Early Experiences*

3:30 Siddharth Manay ..... *Low Level Methods in Image Data Enhancement*

3:45 Shawn Newsam..... *Comparing Shape and Texture Features for Pattern Recognition in Simulation Data*

4:00 Erik Cantu-Paz ..... *Feature Selection in Scientific Applications*

ELECTROMAGNETIC IMAGING AND SIGNAL PROCESSING

John Chang, *Session Chair*

4:15 Peter Haugen ..... *Moving Vehicle Characterization Using Ultra Wide Band (UWB) Radar*

4:30 Hsueh-Yuan Pao..... *Probability Density Function for Waves Propagating in a Straight Perfect Electrical Conductor, (PEC) Rough Wall Tunnel*

4:45 ***ADJOURN***

A G E N D A

Signal and Imaging Sciences Workshop

Center for Advanced Signal and Imaging Sciences

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FRIDAY, NOVEMBER 19, 2004 **BUILDING 123 AUDITORIUM**

8:15AM ..... **Registration and Continental Breakfast**

8:45 **Stephen Azevedo,** C.A.S.I.S. Director ..... **Opening Remarks, Introductions**

9:00 **Prof. Alan V. Oppenheim,** Keynote Speaker, Massachusetts Institute of Technology
Things My Mother Never Told Me (About Signal Processing)

10:00 ***MORNING BREAK— Complimentary***

ELECTROMAGNETIC IMAGING AND SIGNAL PROCESSING
John Chang, *Session Chair*

10:15 John Chang..... *Ultrawideband (UWB) Imaging at Multiple Frames-per-second*

10:30 Kique Romero..... *UWB Through Wall Data Analysis*

10:45 Christine Paulson ..... *Calibration Procedures for Picosecond Electronic Beam-steering*

11:00 John Toeppen ..... *Stereo Vision — A Method of Seeing and Measuring Depth*

APPLIED SIGNAL PROCESSING
Farid Dowla, *Session Chair*

11:15 David Harris..... *Subspace Detection in Seismology*

11:30 Farid Dowla ..... *Secure Radio Frequency Communications*

11:45 Charles Brown Jr..... *Application of Cepstrum-Based Phase Retrieval to Lightning Safety Studies of Explosive and Weapons Storage Facilities*

12:00 ***LUNCH BREAK— Complimentary***

Friday, November 19, 2004 **Building 123 Auditorium**

NATIONAL IGNITION FACILITY (NIF) IMAGING

Laura Kegelmeyer, *Session Chair*

1:15 Laura Kegelmeyer..... *Overview: NIF Optics Inspection Analysis and Verification*

1:30 Marijn Bezuijen ..... *Efficient Detection of Objects of Unknown Size and Shape in Noisy Images*

1:45 Judy Liebman..... *Image Registration for NIF Optics Inspection*

2:00 Walter Ferguson ..... *NIF Beam Noise-Characterization and Simulation*

2:15 Wilbert McClay..... *Detection of Off-normal Images for NIF Automatic Alignment*

2:30 Abdul Awwal..... *Two-step Position Detection for NIF Automatic Alignment*

2:45 ***AFTERNOON BREAK— Complimentary***

NONDESTRUCTIVE CHARACTERIZATION

Harry Martz, *Session Chair*

3:00 Maurice Aufderheide ..... *Simulation of Phase Contrast Imaging for Mesoscale Nondestructive Evaluation*

3:15 Michael Burke..... *Applying Terahertz Imaging at LLNL*

3:30 Grace Clark ..... *Impulse Response Estimation for Spatial Resolution Enhancement in 3D Ultrasonic Nondestructive Evaluation Imagery*

3:45 Karl Fisher ..... *Progress Towards an Electro-acoustic Resonance Technique for Determining Quantitative Material and Geometrical Properties in High Contrast Multi-layer Elastic Structures*

4:00 Michael Quarry ..... *Inspecting Layers of Interest in a Multilayered Structure Using Guided Waves*

4:15 ***ADJOURN***